INFUSION PUMP METHODS, SYSTEMS AND APPARATUS

RELATED APPLICATIONS

[0001] This application is a Continuation of U.S. patent application Ser. No. 14/281,073, filed May 19, 2014 and entitled Infusion Pump Methods, Systems and Apparatus, now U.S. Pat. No. 10,413,682, issued Sep. 17, 2019 (Attorney Docket No. M37), which is a Continuation of U.S. patent application Ser. No. 13/076,067, filed Mar. 30, 2011 and entitled Infusion Pump Methods, Systems and Apparatus, now U.S. Pat. No. 8,728,024, issued May 20, 2014 (Attorney Docket No. 170), which claims the benefit of U.S. Provisional Application No. 61/319,142 filed Mar. 30, 2010 and entitled Infusion Pump Methods, Systems and Apparatus (Attorney Docket No. 109), each of which is hereby incorporated herein by reference in its entirety.

[0002] U.S. patent application Ser. No. 13/076,067 is also a Continuation-in-Part of U.S. patent application Ser. No. 13/121,822, filed Mar. 30, 2011 and entitled Infusion Pump Assembly, now U.S. Pat. No. 9,833,569, issued Dec. 5, 2017 (Attorney Docket No. 173), which application claims priority to PCT Application Serial No. PCT/US09/060158, filed Oct. 9, 2009 and entitled Infusion Pump Assembly, now PCT Publication No. WO 2010/042814 A2, published Apr. 15, 2010 (Attorney Docket No. F51WO) which is itself:

[0003] A Continuation-in-Part of U.S. patent application Ser. No. 12/249,882, filed Oct. 10, 2008 and entitled Infusion Pump Assembly, now U.S. Pat. No. 8,262,616, issued Sep. 11, 2012 (Attorney Docket No. F51);

[0004] A Continuation-in-Part of U.S. patent application Ser. No. 12/249,636, filed Oct. 10, 2008 and entitled System and Method for Administering an Infusible Fluid, now U.S. Pat. No. 9,180,245 (Attorney Docket No. F52);

[0005] A Continuation-in-Part of U.S. patent application Ser. No. 12/249,621, filed Oct. 10, 2008 and entitled Occlusion Detection System and Method, now U.S. Pat. No. 8,223,028, issued Jul. 17, 2012 (Attorney Docket No. F53);

[0006] A Continuation-in-Part of U.S. patent application Ser. No. 12/249,600, filed Oct. 10, 2008 and entitled Multi-Language/Multi-Processor Infusion Pump Assembly, now U.S. Pat. No. 8,267,892, issued Sep. 18, 2012 (Attorney Docket No. F54);

[0007] A Continuation-in-Part of U.S. patent application Ser. No. 12/249,540, filed Oct. 10, 2008 and entitled An Infusion Pump Assembly with a Backup Power Supply, now U.S. Pat. No. 8,066,672, issued Nov. 29, 2011 (Attorney Docket No. F55);

[0008] A Continuation-in-Part of U.S. patent application Ser. No. 12/249,496, filed Oct. 10, 2008 and entitled Pump Assembly with a Removable Cover Assembly, now U.S. Pat. No. 8,016,789, issued Sep. 13, 2011 (Attorney Docket No. F56);

[0009] A Continuation-in-Part of U.S. patent application Ser. No. 12/249,340, filed Oct. 10, 2008 and entitled Medium Connector, now U.S. Pat. No. 8,708,376, issued Apr. 29, 2014 (Attorney Docket No. G05);

[0010] A Continuation-in-Part of U.S. patent application Ser. No. 12/249,891, filed Oct. 10, 2008 and entitled Infusion Pump Assembly, now U.S. Pat. No. 8,034,026, issued Oct. 11, 2011 (Attorney Docket No. G46); and

[0011] A NonProvisional claiming the benefit of priority of U.S. Provisional Patent Application Ser. No. 61/176,508, filed Aug. 5, 2009 (Attorney Docket No. H36),

[0012] All of which are hereby incorporated herein by reference in their entireties.

Technical Field

[0013] This disclosure relates to pump assemblies and, more particularly, to infusion pump assemblies, methods, system and apparatus

BACKGROUND

[0014] An infusion pump assembly may be used to infuse a fluid (e.g., a medication or nutrient) into a user. The fluid may be infused intravenously (i.e., into a vein), subcutaneously (i.e., into the skin), arterially (i.e., into an artery), and epidurally (i.e., into the epidural space).

[0015] Infusion pump assemblies may administer fluids in ways that would be unpractically expensive/unreliable if performed manually by nursing staff. For example, an infusion pump assembly may repeatedly administer small quantities of an infusible fluid (e.g., 0.1 mL per hour), while allowing the user to request one-time larger "bolus" doses.

SUMMARY OF DISCLOSURE

[0016] In accordance with one aspect of the present invention, a system for priming an infusion pump is disclosed. The system includes a priming cap including a septum and configured to matably connect with a male part comprising a needle and attached to a length of tubing for fluid, wherein when matably connected with the male part, the priming cap occludes the tubing. Some embodiments of this aspect of the invention may include a reservoir, wherein the tubing is removably connected to the reservoir wherein fluid from the reservoir is in fluid connection with the tubing.

[0017] In accordance with one aspect of the present invention, a method for priming an infusion pump assembly is disclosed. The method includes connecting a male part comprising a needle attached to a length of tubing to a priming cap comprising a septum, instructing the infusion pump to prime, and priming the infusion pump into the priming cap.

[0018] In accordance with one aspect of the present invention, a method for performing an occlusion alarm check is disclosed. The method includes connecting a male part comprising a needle attached to a length of tubing to a priming cap comprising a septum, instructing the infusion pump to prime, and priming the infusion pump into the priming cap.

[0019] In accordance with one aspect of the present invention, a method for performing an occlusion alarm check is disclosed. The method includes connecting a male part comprising a needle attached to a length of tubing to a priming cap comprising a septum, instructing the infusion pump to prime, priming the infusion pump for a predetermined time into the priming cap, removing the male part from the priming cap once an occlusion alarm occurs, and determining an occlusion alarm failure if an occlusion alarm does not occur after the predetermined amount of time.

[0020] In accordance with one aspect of the present invention, a system for determining a connection to a cannula is disclosed. The system includes a male part connected to a length of tubing, a female part fluidly connected to a cannula, electrical contacts on the male part and the female part wherein, when the male part is connected to the female part, the electrical contacts complete a circuit.